

MAY 1 2013

**MEMORANDUM**

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Superfund

**SUBJECT:** Draft Sampling and Analysis Plan for the  
Remedial Investigation/Feasibility Study  
Former United Zinc Site  
Iola, Kansas

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**FROM:** Venessa Madden  
Ecologist  
ENSV/EAMB

**TO:** Don Bahnke  
Remedial Project Manager  
SUPR/SPES

Per your request, we have reviewed the Draft Sampling and Analysis Plan for the RI/FS for the Former United Zinc Site in Iola, Kansas. If you have any questions or concerns, please contact me at x7794.

**General Comments**

1. The data collected for the RI/FS will be used to write a screening level ecological risk assessment for the site. According to EPA guidance (EPA, 1997), prior to the screening-level problem formulation, a site conceptual model should be developed that addresses five issues:
  - Environmental setting and contaminants known or suspected to exist at the site;
  - Contaminant fate and transport mechanisms that might exist at the site;
  - Mechanisms of ecotoxicity associated with contaminants and likely categories of receptors at the site.
  - Complete exposure pathways that might exist at the site; and
  - Selection of endpoints to screen for ecological risk.

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The issues outlined above will guide the data that will be collected at the site. For example, are there any potentially sensitive environments that may have been impacted by the site (Neosho Madtom habitat or mussel beds in the Neosho River)? What contaminant fate and transport mechanisms may have impacted aquatic and terrestrial habitats near the site (air deposition, past run-off or disposal activities, etc.)? What endpoints will be used to screen for metals and what screening levels will be used? These questions should be addressed in the site conceptual model, which should be included in the sampling plan. Also, a table outlining the screening-level assessment endpoints that will be used to screen contaminants of concern should be included in the sampling plan.

2. Currently, a total of five sediment and surface water samples are proposed. This data would be used to screen potential ecological risk in the watershed. No sampling is proposed to characterize potential terrestrial risk outside the floodplains. Currently, the screening-level ecological risk assessment would be based on five samples for aquatic risk and possibly the twenty-five floodplain samples for terrestrial risk. The sample sizes are inadequate to properly characterize risk at a site of this size.
3. Terrestrial exposure pathways should be evaluated in the ecological risk assessment. The sampling plan does not include an evaluation of this potential exposure scenario, as surface soil is only being collected to evaluate human health risk. We recommend that surface soil samples be collected at the former United Zinc Site, IMP Boats, Inc. Site, Coberly Site, and East Iola Site in areas that may provide suitable habitat for ecological receptors identified in the site conceptual model. In addition, off-site exposure should be evaluated in areas identified as sensitive habitats that may have been impacted by site-related activities.
4. We recommend that EPA's Ecological Soil Screening Levels (EPA, 2005) be used for screening contaminants of potential ecological concern for soil at the site. However, the Eco-SSLs for a number of metals are below typical background concentrations for eastern U.S. soils. Therefore, it will be necessary to collect a background soil data set. A background reference area should be selected that has the same physical, chemical, geological, and biological characteristics as the site being investigated, but has not been affected by activities on the site. The ideal background dataset should be independent (spatially uncorrelated), unbiased and representative of background concentrations. These assumptions will favor widespread random samples. The number of background samples should be calculated according to EPA guidance (EPA, 2002).
5. We recommend that Sediment Quality Guidelines (McDonald *et al.*, 2000), and Kansas Water Quality Criteria be used for screening contaminants in sediment and surface water. Please review these screening values to ensure that typical method detection limits are adequate.
6. Several state and/or federally listed species occur near the site. Critical habitat for the federally listed Neosho Madtom has been identified in the mainstem of the Neosho River near the site. Several mussel beds with state listed species have also been identified in the Neosho River near the site. Potential ecological impacts to these sensitive species should be considered in the site conceptual model.

### **Specific Comments**

7. Section 3.0, Second Bullet. Only arsenic, barium, cadmium, lead and zinc are included in the evaluation of metals in surface soils. However, the text goes on to state that samples will be submitted to the EPA laboratory and analyzed for the target analyte list designated for metals. We

recommend that samples be analyzed for target analyte list, and not simply the metals included in bullet two.

8. Section 3.3.2. Exposure to metals in sediment by benthic organisms is largely dependent on the grain size. We recommend that the sediment samples be sieved using a #10 sieve, with a 2 mm pore diameter to capture the finer grained material. This will provide a more accurate estimate of exposure in the aquatic environment. Please revise Section 3.3.2 and Table 3.1 accordingly.
9. Section 3.3.3. EPA recommends that both total and dissolved surface water samples be collected. In addition, Water Quality Criteria for the protection of aquatic life are hardness-dependent for a number of metals of concern at this site. Therefore, hardness data should be included in the analytical services request for surface water. Please revise the text in Section 3.3.3 and Table 3.1 accordingly.
10. ICP-AES has a typical reporting limit for cadmium in surface water of 1.0 µg/L. The chronic water quality criterion is 0.25 µg/L. Please be advised that lower detection limits for cadmium will need to be requested.
11. Section 4.5. Five sediment and surface water samples are inadequate for characterizing potential ecological risk. In addition, unless there is reason to believe that sediment and streambank soil concentrations are correlated, we are unsure the reasoning behind using streambank soil to target sediment and surface water sampling locations. Therefore, we do not recommend the approach outlined in Section 4.0.

Rather, we recommend that fine sediment and surface water be collected in the Neosho River, Elm Creek and Rock Creek in areas where it is anticipated that contamination may have occurred (based on fate and transport mechanisms developed in the conceptual site model), as well as in areas identified as sensitive habitats. Our preliminary recommendation would be that all of the potential surface water and sediment locations identified for Rock Creek on Figure 4.1 should be sampled (locations 1-19, for a total of 9 samples). The locations on Elm Creek identified in Figure 4.1 should also be sampled for surface water and sediment (location 20-24, for a total of 5 samples).

In addition, we recommend a total of 10 sampling locations on the Neosho River. These locations should be concentrated in areas near Iola in a variety of in-stream habitats. Current locations seven and eight in Figure 4.1 should be retained as possible background locations. The Neosho Madtom is a federally listed endangered species with critical habitat in the mainstem of the Neosho River. Madtom's prefer riffle habitat structure; therefore, sediment sampling in the Neosho River should include riffle habitat sites, as well as depositional areas. Also, sampling location six and eleven are co-located with known sensitive habitats, and should be retained.

Finally, there are three water bodies on Figure 1.2 that are to the south of Highway 54. If there is reason to believe that site-related activities have impacted these water bodies, sediment and surface water should be evaluated for potential ecological risk.

## **References**

USEPA, 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments - Interim Final, June 1997. OSWER Publication Number 9285.7-25.

USEPA, 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites. EPA 540-R-01-003. OSWER 9285.7-41. September 2002.

USEPA, 2005. Guidance for Developing Ecological Soil Screening Levels. OSWER Directive 9285.7-55.